

6-6 Analyzing Graphs of Quadratic Functions

Vertex Form

$$y = a(x-h)^2 + k$$

Vertex (h, k)

a.o.s. $x = h$

Write the equation in vertex form.

ex

$$y = x^2 - 6x + 11$$

$$y - 11 = x^2 - 6x + 9$$

$$y - 2 = (x - 3)^2$$

$$y = (x - 3)^2 + 2$$

Graph it!

$$V(3, 2)$$

h translates the graph horizontally

k translates the graph vertically

a controls the direction and opening

Write the equation in vertex form.

ex

$$y = 3x^2 + 2x$$

$$y = 3\left(x^2 + \frac{2}{3}x + \frac{1}{9}\right)$$

$$y + \frac{1}{3} = 3\left(x + \frac{1}{3}\right)^2$$

$$y = 3\left(x + \frac{1}{3}\right)^2 - \frac{1}{3}$$

$$V\left(-\frac{1}{3}, -\frac{1}{3}\right)$$

Write the equation in vertex form.

ex

$$y = -2x^2 + 20x - 35$$

$$\begin{aligned} y + 35 &= -2x^2 + 20x \\ y + 35 &= -2(x^2 - 10x + 25) \\ y - 15 &= -2(x - 5)^2 \\ y &= -2(x - 5)^2 + 15 \\ V(5, 15) \end{aligned}$$

Write the equation in vertex form.

ex

$$y = 4x^2 + 2$$

$$y = 4(x + 0)^2 + 2$$

$$V(0, 2)$$

Matching

1. $y = 3x^2$

2. $y = \frac{-1}{3}x^2$

3. $y = 3(x + 2)^2$

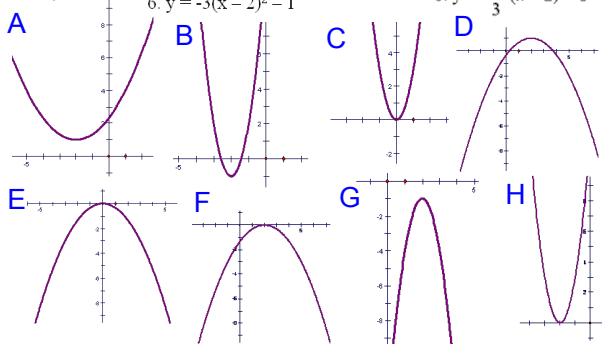
4. $y = 3(x + 2)^2 - 1$

5. $y = \frac{1}{3}(x + 2)^2 + 1$

7. $y = \frac{-1}{3}(x - 2)^2$

8. $y = \frac{-1}{3}(x - 2)^2 + 1$

6. $y = -3(x - 2)^2 - 1$



Game

HW
p326
15-31 odd

Write each quadratic function in vertex form, if not already in that form. Then identify the vertex, axis of symmetry, and direction of opening.

15. $y = -2(x + 3)^2$

17. $y = 5x^2 - 6$

19. $y = -x^2 - 4x + 8$

21. $y = -3x^2 + 12x$

23. $y = 4x^2 + 8x - 3$

25. $y = 3x^2 + 3x - 1$

Graph each function.

27. $y = 4(x + 3)^2 + 1$

29. $y = \frac{1}{4}(x - 2)^2 + 4$

31. $y = x^2 + 6x + 2$